Bellwork: 5/14/13

Evaluate the following: (use your calculator - no decimals!)

1) $(16)^{\frac{3}{4}}$ 2) $\left(\frac{1}{36}\right)^{\frac{1}{2}}$ 3) $\left(\frac{27}{125}\right)^{\frac{1}{3}}$ 4) $(49)^{\frac{-3}{2}}$

8 $\frac{1}{6}$ $\frac{3}{5}$ $\frac{1}{343}$

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Section 7.3 - Logarithmic Functions

Objective: To solve and evaluate logarithmic expressions

Logarithms: inverse of an exponential equation (used to solve equations w/ different bases)

☺ With logarithms, you can write an exponential equation in an equivalent logarithmic form.

Exponential Form

$10^3 = 1000$

base: 10

exponent: 3

answer: 1000

Logarithmic Form

$\log_{10} 1000 = 3$

base: 10

*use "swirl method"

$10^3 = 1000$

$\log_{10} 1000 = 3$

Exponential Form	Logarithmic Form
$2^5 = 32$	$\log_2 32 = 5$
$3^{-2} = \frac{1}{9}$	$\log_3 \frac{1}{9} = -2$
$6^2 = 36$	$\log_6 36 = 2$
$16^{\frac{1}{2}} = 4$	$\log_{16} 4 = \frac{1}{2}$
$\left(\frac{1}{64}\right)^{\frac{1}{2}} = \frac{1}{8}$	$\log_{\frac{1}{64}} \frac{1}{8} = \frac{1}{2}$
$5^0 = 1$	$\log_5 1 = 0$
$8^1 = 8$	$\log_8 8 = 1$

Solve for x:

Example 1:

$\log_5 125 = x$

$5^x = 125$

$x = 3$

Example 2:

$\log_2 x = 4$

$2^4 = x$

$x = 16$

Example 3:

$\log_3 x = -2$

$3^{-2} = x$

$x = \frac{1}{9}$

Example4:

$\log_4 \frac{1}{16} = x$

$4^x = \frac{1}{16}$

$x = -2$

Exercises: Find the value of x:

1) $\log_x 64 = 5$

2) $\log_3 x = 4$

3) $\log_4 64 = x$

4) $\log_x 25 = 2$

5) $\log_3 x = 6$

6) $\log_7 x = 3$

7) $\log_x \frac{1}{8} = 3$

8) $\log_7 1 = x$

9) $\log_x \frac{1}{49} = -2$

10) $\log_{\frac{1}{2}} 16 = x$

11) $\log_5 x = 1$

12) $\log_5 \frac{1}{125} = x$